

MIGRATION of SOME CHEMICAL ELEMENTS In SPHERICAL STRESS WAVES. V. Feldman", L.

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Study of impact formations in astroblemes shows, what yet prior to the beginning a melting (at the stage of diaplectic transformations of minerals) mobility of main rockforming components - K, Na, Fe, Ca, Mg is fixed. For them the interphased migration is marked [Feldman, 1990; Sazonova, 1992; Feldman, 1994 and other]. However the quantitative characteristic of this process in natural formations is complicated, personally, it is not possible to find out change of intensity of migration depending on amplitude of a shock wave.

Therefore experimental research of mobility of components were begun at a shock loading. Below first results of study of migration of components are stated at a compression in samples of a fine-grained pegmatite and quartz-plagioclase-garnet-hedenbergite rock by converging spherical shock waves [Volkov et al., 1992; Litvinov et al., 1991].

For realization of experiment rocks in the form of balls, 48.88 mm in diameter , which has been weltd up in vacuum into the hermetic jacket of 12C18N10T steel , has been subjected to impulsed loading in spherically converging detonation waves of the superposed layer of explosive. The hermetic jacket provided preservation of rocks during experiment and after it and thus it is possible to consider system closed. The shock loadings on substance from edge of a ball to centre accrued with 200 cbar up to 2500 cbar [Litvinov et al.,1991].

In a sample of a pegmatite after experience three zones were found out: 1) external zone of cracks in width 12mm; 2) zones of amorphous substance (diaplectic glasses) in width 9mm (12-

21mm on radius); 3) internal zones of melt glass in width 4mm. In a zone of amorphous substance is fixed two types migration of substance. First, it is an exchange of cationes (K and Na) between feld spars (albite and microcline), that results in occurrence of gradual transitions between these minerals, instead of sharp borders, characteristic of initial rock. Thus width of a zone of transition between minerals increases directly proportionally to a shock loading from 0 micrometers in initial rock up to 250 micrometers at 400 kbars. The second type of migration of substance is characterized by a carrying out of the same components from amorphous substance in a zone of a melting, that results to deficit of cationes in feld spars, from that the sum of cationes in the formula decreases from usual for these minerals 1 formular unit (f.u.) up to 0,4-0,5 (f.u.) in limiting cases.

In a sample of quartz-plagioclase-garnet-hedenbergite rock is found out 4 zones on radius of a ball: 1) external zone of cracks in width 11 mm, the loadings on rock here reached 200-250 cbar; 2) zones with diaplectic quartz and plagioclase, width 5 mm, where the loadings on rock changed from 250 up to 370 kbars; 3) zones with melt glasses on a quartz and plagioclase, width 4,5 mm with loadings from 370 up to 780 kbars; 4) internal zones of a complete melting and evaporations of substance with formationining) of mixed glasses on minerals. Pyroxenes from these zones were studied. In the second and third zones intensive migration of components from pyroxenes is found out, in which contents of iron and calcium decreases. The total

sum of cationes at recalculation of the chemical analyses on the formula of a pyroxene becomes less than 2. This phenomenon, probably, is connected to a maintenance of iron and calcium from a crystal structure of a pyroxene, i.e. with the beginning of destruction of structure of this mineral. The intensity of this process accrues from the second zone to third.

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